# FACTORISING BY GROUPING IN PAIRS

Factorise:

1 $a(x+2)+b(x+2)$

$=(x+2)(a+b)$

2 $3a(2b-3c)-m(2b-3c)$

$=(2b-3c)[3a-m]$

3 $p(a+b)+q(a+b)-r(a+b)$

$=(a+b)[p+q-r]$

4 $x^2(2x-1)+4(2x-1)$

$=(2x-1)(x^2+4)$

5 $ax+4a+bx+4b$

$=a(x+4)+b(x+4)$

$=(x+4)(a+b)$

6 $x^2-xy+xz-yz$

$=x(x-y)+z(x-y)$

$=(x-y)(x+z)$

10 $a^3+3a^2b+ab^2+3b^3$

$=a^2(a+3b)+b^2(a+3b)$

$=(a+3b)(a^2+b^2)$

11 $ac-2bc-2ad+4bd$

$=c(a-2b)+d(-2a+4b)$

$=c(a-2b)-2d(a-2b)$

$=(a-2b)(c-2d)$

12 $3xy-6y+7x-14$

$=y(3x-6)+7(x-2)$

$=3y(x-2)+7(x-2)$

$=(x-2)(3y+7)$

16 $x^3+3x^2+4x+12$

$=x^2(x+3)+4(x+3)$

$=(x+3)(x^2+4)$

17 $p^2q-pq^2+5p-5q$

$=pq(p-q)+5(p-q)$

$=(p-q)(pq+5)$

18 $m^2p+m^2+np+n$

$=m^2(p+1)+n(p+1)$

$=(p+1)(m^2+n)$

19 $x^2y+x^2+y+1$

$=x^2(y+1)+(y+1)$

$=(y+1)(x^2+1)$

20 $ab-3a-4b+12$

$=a(b-3)-4(b-3)$

$=(b-3)(a-4)$

21 $2x-6y-xy+3y^2$

$=2(x-3y)+y(-x+3y)$

$=2(x-3y)-y(x-3y)$

$=(x-3y)(2-y)$

22 When $3m^2-3mn-m+n$ is factorised, the answer is:

**A** $(3m-1)(m-n)$ B $(3m-n)(m-1)$ C $(3m-1)(m+n)$ D $(3m+1)(m-n)$

$3m^2-3mn-m+n=3m(m-n)-(m-n)=(m-n)(3m-1)$

23 Indicate whether each answer is a correct or incorrect factorisation of $2x^3-2x^2-2x+2$.

(a) $2(x+1)(x+1)(x-1)$ **(b)** $2(x+1)(x-1)^2$ **(c)** $2(x+1)(x-1)(x-1)$ (d) $2(x-1)(x+1)^2$

$2x^3-2x^2-2x+2=2[x^3-x^2-x+1]$

$=2[x^2(x-1)-(x-1)]=2[x-1][x^2-1]$

$=2(x-1)(x-1)(x+1)$

$=2(x-1)^2(x+1)$